ABSTRACT

High purity tantalum metals and alloys containing the same are described. The tantalum metal preferably has a purity of at least 99.995% and more preferably at least 99.999%. In addition, tantalum metal and alloys thereof are described, which either have a grain size of about 50 microns or less, or a texture in which a (100) intensity within any 5% increment of thickness is less than about 15 random, or an incremental log ratio of (111):(100) intensity of greater than about –4.0, or any combination of these properties. Also described are articles and components made from the tantalum metal which include, but are not limited to, sputtering targets, capacitor cans, resistive film layers, wire, and the like. Also disclosed is a process for making the high purity metal which includes the step of reacting a salt-containing tantalum with at least one compound capable of reducing this salt to tantalum powder and a second salt in a reaction container. The reaction container or liner in the reaction container and the agitator or liner on the agitator are made from a metal material having the same or higher vapor pressure of melted tantalum. The high purity tantalum preferably has a fine and uniform microstructure.